0.a. Goal

Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

0.b. Target

Target 15.2: By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally

0.c. Indicator

Indicator 15.2.1: Progress towards sustainable forest management

0.e. Metadata update

February 2021

0.f. Related indicators

15.1.1: Forest area as a proportion of total land area

0.g. International organisations(s) responsible for global monitoring

Food and Agriculture Organization of the United Nations (FAO)

1.a. Organisation

Food and Agriculture Organization of the United Nations (FAO)

2.a. Definition and concepts

Definition:

“Sustainable forest management” (SFM) is a central concept for Goal 15 and target 15.1 as well as for target 15.2. It has been formally defined, by the UN General Assembly, as follows:

[a] dynamic and evolving concept [that] aims to maintain and enhance the economic, social and environmental values of all types of forests, for the benefit of present and future generations” (Resolution A/RES/62/98)

The indicator is composed of five sub-indicators that measure progress towards all dimensions of sustainable forest management. The environmental values of forests are covered by three sub-indicators focused on the extension of forest area, biomass within the forest area and protection and maintenance of biological diversity, and of natural and associated cultural resources. Social and economic values of forests are reconciled with environmental values through sustainable management plans. The sub-indicator provides further qualification to the management of forest areas, by assessing areas which are independently verified for compliance with a set of national or international standards.

The sub-indicators are:

1. Annual forest area change rate
2. Above-ground biomass stock in forest
3. Proportion of forest area located within legally established protect areas
4. Proportion of forest area under a long-term forest management plan
5. Forest area under an independently verified forest management certification scheme

A dashboard is used to assess progress related to the five sub-indicators. The adoption of the dashboard approach aims at ensuring consideration of all dimensions of sustainable forest management and provides for clear view of areas where progress has been achieved.

Concepts:

See Annex 1 with Terms and Definitions.

2.b. Unit of measure

SUB-INDICATOR	UNIT
Annual forest area change rate	Percent

Above-ground biomass stock in forest	Tonnes per hectare
Proportion of forest area located within legally established protect areas	Percent
Proportion of forest area under a long-term forest management plan	Percent
Forest area under an independently verified forest management certification scheme	1000 hectares

3.a. Data sources

Sub-indicators 1 to 4

Data are collected by FAO through the Global Forest Resources Assessment (FRA). Assessments have been carried out at regular intervals since 1946 and are now produced every five year. The latest of these assessments, FRA 2020, contains information for 236 countries and territories on about 60 variables related to the extent of forests, their conditions, uses and values for several points in time.

Sub-indicator 5

Currently, forest certification by the Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification (PEFC) are included in the data submissions. The latter includes several national/regional certification schemes that have been endorsed according to the PEFC standards.

Data on forest certification are submitted annually to FAO by the head offices of the respective forest certification scheme. Data include the area certified by each scheme, as well as areas that are double-certified by the two schemes. That allows for estimating the total certified forest area, adjusted for double certified area.

3.b. Data collection method

Sub-indicators 1 to 4

Data on these sub-indicators are collected through FAO's Global Forest Resources Assessment (FRA) programme. Officially nominated national correspondents and their teams prepare the country reports for the assessment. Some prepare more than one report as they also report on dependent territories. For the remaining countries and territories where no information is provided, a report is prepared by FAO using existing information and a literature search.

All data are provided to FAO by countries in the form of a country report through an on-line platform following a standard format, which includes the original data and reference sources and descriptions of how these have been used to estimate the forest area for different points in time. The on-line platform was used for all data entry, review and quality control.

In order to obtain internationally comparable data, countries are requested to provide national categories and definitions, and in case these are different than the FAO categories and definitions, countries are requested to perform a reclassification of national data to correspond to the FAO categories and definitions and to document this step in the country report. Countries are also requested to use interpolation or extrapolation of national data in order to provide estimates for the specific reporting years.

Sub-indicator 5

Data are annually reported by the certification bodies to FAO and consolidated into estimates of total certified forest area, which are made available to the countries through the FRA online platform where country officials can view the data that are being submitted.

3.c. Data collection calendar

Source data collection for sub-indicators 1 to 4 was initiated in 2018 and concluded in 2019. Data collection for the next FRA is expected to start in 2022.

Data on sub-indicator 5 is reported by the certification bodies to FAO by the end of each calendar year, referring to the status of certified forest area by end of June that year.

3.d. Data release calendar

Data with updated time series and including year 2020 was released July 2020. Next release of a complete FRA dataset is scheduled for 2025. The possibilities of a more frequent reporting on forest area and other key indicators are currently being evaluated, and some countries may provide updates before 2025. Data on forest certification is updated annually.

3.e. Data providers

The data for subindicators 1 to 4 are provided by the countries through a global network of officially nominated national correspondents. For the countries and territories which do not have a national correspondent, a report is prepared by FAO using previously reported information, literature search, remote sensing or their combination.

For subindicator 5, forest certification, data are provided by head offices of respective forest certification scheme.

3.f. Data compilers

Food and Agriculture Organisation of the United Nations (FAO)

3.g. Institutional mandate

Article 1 of FAO's constitution specifies that, "The Organization shall collect, analyze, interpret, and disseminate information related to nutrition, food and agriculture." In this regard, FAO collects national level data from member countries, which it then standardizes and disseminates through corporate statistical databases. FAO is the custodian UN agency for 21 SDG indicators, including 15.2.1.

4.a. Rationale

The definition of SFM by the UN General Assembly contains several key aspects, notably that sustainable forest management is a concept which varies over time and between countries, whose circumstances – ecological, social and economic – vary widely, but that it should always address a wide range of forest values, including economic, social and environmental values, and take intergenerational equity into account.

Clearly a simple measure of forest area is insufficient to monitor sustainable forest management as a whole. The significance of the five sub-indicators can be briefly explained as follows:

1. Trends in forest area are crucial for monitoring SFM. The first sub-indicator focuses on both the direction of change (whether there is a loss or gain in forest area) and how the change rate varies over time; the latter is important in order to capture progress among countries that are losing forest area, but have managed to reduce the rate of annual forest area loss.
2. Changes in the above-ground biomass stock in forest indicate the balance between gains in biomass stock due to forest growth and losses due to wood removals, natural losses, fire, wind, pests and diseases. At country level and over a longer period, sustainable forest management would imply a stable or increasing biomass stock per hectare, while a long-term reduction of biomass stock per hectare would imply either unsustainable management of the forests and degradation or unexpected major losses due to fire, wind, pests or diseases.
3. The change in forest area within legally protected areas is a proxy for trends in conservation of forest biodiversity as well as cultural and spiritual values of forests and thus a clear indication of the political will to protect and conserve forests. This indicator is related to the CBD Aichi Target 11 which calls for each country to conserve at least 17 per cent of terrestrial and inland water areas.
4. The fourth sub-indicator looks at the forest area that is under a long-term forest management plan. The existence of a documented forest management plan is the basis for long term and sustainable management of the forest resources for a variety of management objectives such as for wood and non-wood forest products, protection of soil and water, biodiversity conservation, social and cultural use, and a combination of two or several of these. An increasing area under forest management plan is therefore an indicator of progress towards sustainable forest management.
5. The fifth sub-indicator is the forest area that is certified by an independently verified forest management certification scheme. Such certification schemes apply standards that generally are higher than those established by the countries' own normative frameworks, and compliance is verified by an independent and accredited certifier. An increase in certified forest area therefore provides an additional indication of progress towards sustainable forest management. It should however be noted that there are significant areas of sustainably managed forest which are not certified, either because their owners have chosen not to seek certification (which is voluntary and market-based) or because no credible or affordable certification scheme is in place for that area.

4.b. Comment and limitations

The five sub-indicators chosen to illustrate progress towards sustainable forest management do not fully cover all aspects of sustainable forest management. In particular, social and economic aspects are summarized under the sub-indicators on areas under sustainable forest management plans. Furthermore, as the trends are calculated using only those countries which have data complete time series, different sub-indicators may reflect different sets of countries.

While the dashboard illustrates the progress on the individual sub-indicators, there is no weighting of the relative importance of the sub-indicators.

4.c. Method of computation

National data on forest area, biomass stock, forest area within protected areas, and forest area under management plan are reported directly by countries to FAO for pre-established reference years. Based on the country reported data, FAO then makes country-level estimates of the forest area net change rate using the compound interest formula. The proportion of forest area within protected area and under management plan is calculated using the reported areas and the official FAOSTAT land area for reference year 2015. Data on forest area under an independently verified forest management certification scheme are reported to FAO by the head offices of respective forest certification scheme, who are jointly adjusting the figures to remove any double accounting.

No dashboard traffic lights are made at country level.

4.d. Validation

All data submitted by countries to FRA, including the FAO estimates made in case of desk studies, are available at the FRA on-line platform (http://fra-platform.herokuapp.com). The platform also includes the sub-indicators for 15.2.1. A request for validation was sent to the respective Head of Forestry before finalization and publishing of data.

4.f. Treatment of missing values (i) at country level and (ii) at regional level

- At country level

For countries and territories where no information was provided to FAO for FRA 2020 (47 countries and territories representing 0.5 percent of the global forest area), a report was prepared by FAO using existing information from previous assessments, literature search, remote sensing or a combination of two or more of them.

For the above-ground biomass sub-indicator, imputation of the missing values has been carried out by FAO for those countries with at least one data point in the time series. The value of the data point closest in time was used as imputed value. For those countries where no value was reported for any of the reporting years, no imputation was done and the values for all years were set as "Not Available".

- At regional and global levels

See above.

4.g. Regional aggregations

See Annex 2 – Methodology. It should be noted that for those sub-indicators where there are gaps in the data set, only the countries with complete data for the relevant years (either provided by the countries or estimated by FAO) are included in the regional and global aggregates. Annex 2 also shows how the dashboard traffic lights are applied at global and regional level.

4.h. Methods and guidance available to countries for the compilation of the data at the national level

Detailed methodology and guidance on how to prepare the country reports through an online reporting platform and to convert national data according to national categories and definitions to FAO's global categories and definitions is found in the documents "*Guidelines and Specifications*" (www.fao.org/3/I8699EN/i8699en.pdf) and "*Terms and Definitions*" (www.fao.org/3/I8661EN/i8661en.pdf).

FAO supports the reporting process through capacity development on reporting methodology and remote sensing. The reporting platform provides easy access to relevant and freely available global remote sensing data sets and products.

4.i. Quality management

FAO is responsible for the quality of the internal statistical processes used to compile the published datasets. The FAO Statistics Quality Assurance Framework (SQAF), available at: http://www.fao.org/docrep/019/i3664e/i3664e.pdf, provides the necessary principles, guidelines and tools to carry out quality assessments. FAO is performing an internal bi-annual survey (FAO Quality Assessment and Planning Survey) designed to gather information on all of FAO's statistical activities, notably to assess the extent to which quality standards are being implemented with a view to increasing compliance with the quality dimensions of SQAF, documenting best practices and prepare quality improvement plans, where necessary. Domain-specific quality assurance activities are carried out systematically (e.g. quality reviews, self-assessments, compliance monitoring).

4.j. Quality assurance

Date reported by countries to FAO are subject to a rigorous review process to ensure correct use of definitions and methodology as well as internal consistency. A comparison is made with past assessments and other existing data sources. Regular contacts between national correspondents and FAO staff by e-mail and regional/sub-regional review workshops form part of this review process.

5. Data availability and disaggregation

Data availability:

The Global Forest Resources Assessment 2020 collected data from 236 countries and territories. Below is a breakdown of the number of countries covered by region and by sub-indicator:

Region Name	Total number of countries	Number of countries reporting latest year					Percentage of countries reporting latest year			
		Annual forest area change rate	**Above-ground biomass stock in forest**	**Proportion of forest area located within legally established protect areas**	**Proportion of forest area under a long term forest management plan**	**Forest area under an independently verified forest management certification scheme**	**Forest area annual net change rate**	**Above-ground biomass stock in forest**	**Proportion of forest area located within legally established protect areas**	**Proportion of forest area under a long term forest management plan**
World	236	236	205	162	128	236	100%	87%	69%	54%
Central and Southern Asia	14	14	12	9	9	14	100%	86%	64%	64%

Central Asia	5	5	4	3	3	5	100%	80%	60%	60%
Southern Asia	9	9	8	6	6	9	100%	89%	67%	67%
Eastern and South-Eastern Asia	16	16	16	11	9	16	100%	100%	69%	56%
Eastern Asia	5	5	5	3	4	5	100%	100%	60%	80%
South-Eastern Asia	11	11	11	8	5	11	100%	100%	73%	45%
Northern Africa and Western Asia	25	25	21	13	10	25	100%	84%	52%	40%
Northern Africa	7	7	7	4	4	7	100%	100%	57%	57%
Western Asia	18	18	14	9	6	18	100%	78%	50%	33%
Sub-Saharan Africa	51	51	48	43	30	51	100%	94%	84%	59%
Europe and Northern America	55	55	47	40	38	55	100%	85%	73%	69%
Europe	50	50	44	36	34	50	100%	88%	72%	68%
Northern America	5	5	3	4	4	5	100%	60%	80%	80%
Latin America and the Caribbean	50	50	43	37	23	50	100%	86%	74%	46%
Oceania	25	25	18	9	9	25	100%	72%	36%	36%
Oceania (exc. Australia and New Zealand)	22	22	16	7	6	22	100%	73%	32%	27%

Australia and New Zealand	3	3	2	2	3	3	100%	67%	67%	100%
Landlocked developing countries (LLDCs)	32	32	28	22	17	32	100%	88%	69%	53%
Least Developed Countries (LDCs)	47	47	42	36	23	47	100%	89%	77%	49%
Small island developing States (SIDS)	53	53	42	27	12	53	100%	79%	51%	23%

Time series:

2000, 2010, 2015, 2016, 2017, 2018, 2019, 2020

Disaggregation:

No further disaggregation of this indicator.

6. Comparability/deviation from international standards

Sources of discrepancies:

The national figures in the database are reported by the countries themselves following a standardized format, definitions and reporting years, thus eliminating any discrepancies between global and national figures. The reporting template requests that countries provide the full reference for original data sources as well as national definitions and terminology. Separate sections in the template country reports deal with the analysis of data (including any assumptions made and the methods used for estimates and projections to the common reporting years); calibration of data to the official land area as held by FAO; and reclassification of data to the classes used in FAO's Global Forest Resources Assessments.

Regarding the data on forest area under an independently verified forest management certification scheme, these are usually not part of official national statistics, and are maintained by local offices of the respective certification schemes. They in turn report their data to their head offices. As certified forest area is dynamic and can change monthly as some certificates expire and new certificates come. Therefore, the data are requested to correspond to the end of June each year. However, data are not always reported by the local offices according to that date.

7. References and Documentation

URL: http://www.fao.org/forest-resources-assessment/en/

References:

Global Forest Resources Assessment 2020, Guidelines and Specifications (www.fao.org/3/I8699EN/i8699en.pdf)

Global Forest Resources Assessment 2020, Terms and Definitions (www.fao.org/3/I8661EN/i8661en.pdf).

Annex 1 – Terms and Definitions

FOREST

Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds *in situ*. It does not include land that is predominantly under agricultural or urban land use.

Explanatory notes

1. Forest is determined both by the presence of trees and the absence of other predominant land uses. The trees should be able to reach a minimum height of 5 meters.
2. Includes areas with young trees that have not yet reached but which are expected to reach a canopy cover of at least 10 percent and tree height of 5 meters or more. It also includes areas that are temporarily unstocked due to clear-cutting as part of a forest management practice or natural disasters, and which are expected to be regenerated within 5 years. Local conditions may, in exceptional cases, justify that a longer time frame is used.
3. Includes forest roads, firebreaks and other small open areas; forest in national parks, nature reserves and other protected areas such as those of specific environmental, scientific, historical, cultural or spiritual interest.
4. Includes windbreaks, shelterbelts and corridors of trees with an area of more than 0.5 hectares and width of more than 20 meters.
5. Includes abandoned shifting cultivation land with a regeneration of trees that have, or are expected to reach, a canopy cover of at least 10 percent and tree height of at least 5 meters.
6. Includes areas with mangroves in tidal zones, regardless whether this area is classified as land area or not.

7. Includes rubberwood, cork oak and Christmas tree plantations.
8. Includes areas with bamboo and palms provided that land use, height and canopy cover criteria are met.
9. Excludes tree stands in agricultural production systems, such as fruit tree plantations, oil palm plantations, olive orchards and agroforestry systems when crops are grown under tree cover. Note: Some agroforestry systems such as the “Taungya” system where crops are grown only during the first years of the forest rotation should be classified as forest.

ABOVE-GROUND BIOMASS

All living biomass above the soil including stem, stump, branches, bark, seeds, and foliage.

Explanatory note

1. In cases where forest understorey is a relatively small component of the aboveground biomass carbon pool, it is acceptable to exclude it, provided this is done in a consistent manner throughout the inventory time series.

PROTECTED AREAS

Areas especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means.

FOREST AREA WITHIN PROTECTED AREAS

Forest area within formally established protected areas independently of the purpose for which the protected areas were established.

Explanatory notes

1. Includes IUCN Categories I – IV
2. Excludes IUCN Categories V-VI

FOREST AREA WITH MANAGEMENT PLAN

Forest area that has a long-term documented management plan, aiming at defined management goals, which is periodically revised.

Explanatory notes

1. A forest area with management plan may refer to forest management unit level or aggregated forest management unit level (forest blocks, farms, enterprises, watersheds, municipalities, or wider units).
2. A management plan must include adequate detail on operations planned for individual operational units (stands or compartments) but may also provide general strategies and activities planned to reach management goals.
3. Includes forest area in protected areas with management plan.

INDEPENDENTLY VERIFIED FOREST MANAGEMENT CERTIFICATION

Forest area certified under a forest management certification scheme with published standards and is independently verified by a third-party.

Annex 2 – Methodology

Sub-indicator 1 - Annual forest area change rate

Unit: Percent

Reference period: 2010-2020

Method of estimation: Compound annual change rate formula as follows:

$r = [(A_{t2}/A_{t1})^{1/(t2-t1)} - 1]*100$

with:

r = compound annual change rate for the period t_1 - t_2

t_i = time i (year)

A_{t1} = forest area at t_1

A_{t2} = forest area at t_2

Translation to dashboard/traffic light:

The following flowchart explains the logic behind the translation of this indicator to a dashboard/traffic light:

Forest area change direction

Forest area stable

or increasing

Forest area decreasing

Change in forest area loss rate

Loss rate

decreasing

Loss rate stable

or increasing

The forest area change direction is determined by examining the value of the forest area change rate for the most recent period, a negative value indicate a loss of forest area, a zero value means that forest area is stable and a positive value means that forest area has increased. The change in forest area loss rate[1] is based on a comparison of the annual forest area change rate for the period 2010-2020 with the annual forest area change rate for the period 2000-2010 (baseline).

Comments:

This traffic light takes into consideration both the direction of forest area change (if forest area increases or decreases) as well as changes in the rate of forest area loss – the latter important in order to indicate progress among countries that are losing forest area but manage to reduce the loss rate.

The baseline should be updated every 5 years. In 2020 a new baseline was calculated for the period 2000-2010 based on updated country data. Also, if a country reports new historical data to FAO within a 5-year cycle, the baseline for the country will be recalculated accordingly.

Sub-indicator 2 – Above-ground biomass stock in forest

Unit: tonnes/hectare

Reference year: Latest reporting year

Method of estimation: Reported directly by countries

Translation to dashboard/traffic light:

The indicator value for the latest reporting year is compared with the indicator value for previous reporting year for assessment of continuity of progress since last report.

The ratio (r) between the current indicator value and the previously reported value is calculated; r>1 means an increase in stock per hectare, r<1 means a decrease while 1 indicates no change. A narrow interval for r has been established to indicate a stable condition, and traffic-light colors are assigned as follows:

$r \geq 1.01$

$0.99 < r < 1.01$

$r \leq 0.99$

Sub-indicator 3 – Proportion of forest area located within legally established protected areas.

Unit: Percent

Reference year: Latest reporting year

Method of estimation: Forest area within legally established protected areas / forest area 2015 * 100

Translation to dashboard/traffic light:

The indicator value for latest reporting year is compared the indicator value for previous reporting year for assessment of continuity of progress since last report.

The ratio (r) between the current indicator value and the previously reported value is calculated; r>1 means an increase in forest area within protected areas, r<1 means a decrease while 1 indicates no change. A narrow interval for r has been established to indicate a stable condition, and traffic-light colors are assigned as follows:

$r \geq 1.01$

$0.99 < r < 1.01$

$r \leq 0.99$

Comment:

Using forest area in 2015 as denominator for estimating this indicator ensures that the time series of percentages reflect real changes in the forest area within legally established protected areas and is not affected by changes (losses or gains) in total forest area.

Sub-indicator 4 – Proportion of forest area under a long-term forest management plan.

Unit: Percent

Reference year: Latest reporting year

Method of estimation: Forest area under a long term forest management plan / forest area 2015 * 100

Translation to dashboard/traffic light: The indicator value for latest reporting year is compared with the indicator value for previous reporting year for assessment of continuity of progress since last report.

The ratio (r) between the current indicator value and the previously reported value is calculated; r>1 means an increase in areas under forest management plan, r<1 means a decrease while 1 indicates no change. A narrow interval for r has been established to indicate a stable condition, and traffic-light colors are assigned as follows:

$r \geq 1.01$

$0.99 < r < 1.01$

$r \leq 0.99$

Comment:

Using forest area in 2015 as denominator for estimating this indicator ensures that the time series of percentages reflect real changes in the forest area under forest management plan and is not affected by changes (losses or gains) in total forest area.

Sub-indicator 5 – Forest area under an independently verified forest management certification scheme.

Unit: Thousand hectares

Reference year: Latest reporting year (as of June 30)

Method of estimation: Data is collected directly from the databases of each certification scheme and provided to countries for validation.

Translation to dashboard/traffic light: The indicator value for latest reporting year is compared with the indicator value for previous reporting year for assessment of continuity of progress since last report.

The ratio (r) between the current indicator value and the previously reported value is calculated; r>1 means an increase in areas under an independent forest management certification scheme, r<1 means a decrease while 1 indicates no change. A small interval for r has been established to indicate a stable condition, and traffic-light colors are assigned as follows:

$r \geq 1.01$

$0.99 < r < 1.01$

$r \leq 0.99$

Comments:

Using June 30 as the date for reporting, allows for the certification bodies to have their databases updated so they can provide information to FAO by end of the year, and then be included in the annual reporting to SDG in the beginning of the following year.

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[1] annual forest area loss rate = - (annual forest area change rate) ↑